CHAPTER I

INTRODUCTION

1.1 Background of the Study

The advancements in Artificial Intelligence (AI) and Natural Language Processing (NLP) technologies have significantly contributed to the development of chatbots capable of engaging in more complex and in-depth interactions with humans. By harnessing the ability to process and analyze vast amounts of data, chatbots were able to comprehend context, intent, and emotions in human conversations. Meanwhile, NLP facilitated chatbots in understanding and generating natural language, rendering interactions with users more natural and human-like. For instance, this technology enabled chatbots to perform tasks previously exclusive to humans, such as providing personalized advice, answering questions with specific details, and adapting to user preferences over time. Recent research by Lyu et al. (2023) indicated that modern chatbots could handle more intricate conversations, recognize various nuances in language, and deliver timely and relevant responses. This presented significant opportunities for applying chatbots across multiple fields, including education, customer service, and healthcare, where effective and efficient interaction was paramount.

AI chatbots offer various benefits in language learning, enabling learners to develop language skills more deeply and meaningfully. One of the main advantages was the provision of authentic resources that allowed learners to interact in realistic contexts. For instance, the Gemini Chatbot, based on a large language model (LLM), offered numerous benefits for enhancing English language teaching. Its interactive and personalized capabilities enabled students to learn and practice English engagingly and effectively. This helped learners develop speaking, listening, and comprehension skills in real-life situations, boosting their confidence in using the language. The interactivity provided by this chatbot also allowed learners to receive immediate and personalized feedback. When a learner makes a mistake, the chatbot can promptly offer corrections and explanations, helping the

learner understand and rectify their errors in real-time. This not only accelerated the learning process but also made it more efficient and effective. Continuous and specific feedback helped learners to continually improve their language skills, from grammar to pronunciation and vocabulary. Additionally, the chatbot could be tailored to the individual needs of learners, offering a personalized learning approach. The chatbot could analyze learners' progress, identify areas needing improvement, and adjust the learning materials according to each learner's skill level and learning pace. This ensured that each learner received a learning experience that matched their needs, enhancing their motivation and engagement in the learning process. Furthermore, this chatbot provides flexible and easily accessible learning anytime and anywhere. Learners could practice language through the chatbot outside of class hours and in various situations, such as while traveling or at home. This flexibility allowed learners to optimize their time and maintain continuity in the learning process.

Research by Taj et al. (2017) and Loncar et al. (2023) indicated that the use of AI chatbots in language learning not only enhanced learners' language proficiency but also made the learning process more engaging and enjoyable. With the gamification and interactivity elements offered by chatbots, learners were more motivated to learn and more actively involved in the learning process. Overall, AI chatbots offered powerful tools to support the development of deeper and more meaningful language skills, providing a richer, more interactive, and effective learning experience.

Studies have shown that chatbots could improve language proficiency and skills in various aspects, such as conversation, pronunciation, and writing. For instance, research by Shin et al. (2021) suggested that chatbots could enhance students' conversational skills by providing a platform that allowed them to practice speaking repeatedly without the social pressure they might experience in direct human conversations. Additionally, these chatbots could offer immediate feedback on pronunciation, enabling students to correct their mistakes instantly. Research by Yang et al. (2022) and Chen et al. (2022) also demonstrated that using chatbots

could help improve students' writing skills by providing grammatical corrections and contextual improvement suggestions.

However, despite the many advantages offered by Gemini and other AI chatbots in language learning, they also had limitations. One major limitation was their reliance on existing data. This meant that the responses and knowledge provided by Gemini were based on pre-programmed data or information sourced from available resources. This could lead to potential inaccuracies, especially if the data used was incomplete or outdated. For example, if a chatbot used data from less credible or outdated sources, the information provided to users could be incorrect or misleading (Pavlik, 2023). Additionally, the language resources used by chatbots like Gemini might have been limited. This could mean that the chatbot might not have had the ability to understand or answer highly specific questions or very specialized contexts. For instance, in technical language learning or dialect- or region-specific terminology, the chatbot might not have been able to provide adequate responses. Overall, while chatbots like Gemini offered promising tools to support language learning by providing a personalized and interactive experience, users still needed to critically evaluate the information provided. This critical evaluation included checking the accuracy and relevance of the information and confirming it with additional sources if necessary. With this approach, chatbots could be effective and reliable tools in language learning.

Various studies have discussed the use of chatbots in education. In a previous study by Ali et al. (2023) conducted with English language students, it was found that chatbots could increase students' motivation to learn English. The researchers even recommended the use of chatbots in classrooms. Another study by Alneyadi & Wardat (2023) examined the impact of chatbots on student learning outcomes, revealing that students using chatbots achieved higher grades and improved comprehension. Additionally, a study by Ramadhan et al. (2023), which analyzed 23 journals related to the use of chatbots in education, concluded that the use of chatbots could enhance the quality and productivity of learning. However, improper use of chatbots posed a threat to academic integrity, potentially increasing

plagiarism and cheating, which could result in lower-quality graduates. Furthermore, a study investigated the positive and negative implications of chatbots for students and teachers in education by Huang & Li (2023). Previous research by Tuhuteru also explored the role of chatbots in improving college students' productivity. This study concluded that chatbots played a significant role in enhancing student productivity by providing useful information and resources, supporting language skills improvement, facilitating collaboration, increasing time efficiency and effectiveness, and offering support and motivation (Fauzi et al., 2023).

Although several studies have examined the use of chatbot technology, no research have yet investigated students' experiences with Gemini. Therefore, a smaller-scale study was needed to gain a more specific and relevant understanding of Gemini's use in the context of language education. A smaller-scale study with college student participants would provide more detailed insights into their perceptions, experiences, and needs regarding the use of Gemini in language learning. Focusing on college students, this research aimed to delve deeper into how this technology could be used to support advanced-level learning, as well as the challenges or barriers students might face in adopting and integrating this technology into their academic activities. Moreover, this study aimed to identify effective strategies to increase acceptance and use of Gemini among students, as well as its impact on their academic achievement and language skills development. The findings from this study could provide valuable guidance for educational institutions and policymakers to improve the use of technology in higher education. Therefore, the researcher aimed to explore college students' experiences in using Gemini for English language learning.

1.2 Research Novelty

Several studies have discussed the Gemini chatbot. The study titled "Exploring Google Bard's (Gemini) Role in Enhancing Research Articles in Computational Thinking and Mathematics Education," conducted in Indonesia by Supriyadi (2024) investigated how Google Bard (Gemini) assisted in the creation of research articles

within the fields of computational thinking and mathematics education. Using Google Bard, the researcher searched the Scopus database for articles published in the past three years by authors from Indonesia. The search yielded four articles, three accessible for download and stored in Google Drive. The study demonstrated that Google Bard effectively organized, retrieved, and created research articles. Features such as multiple drafts and audio responses enhanced accessibility and user experience. Researchers and educators were encouraged to leverage Google Bard for collaboration, document organization, and information retrieval to make the research process more efficient in computational thinking and mathematics education.

Subsequently, a study by Alnasib & Alharbi (2024) in Saudi Arabia also identified challenges faced by students using Gemini for learning English as a Foreign Language (EFL) and evaluated how effectively Gemini motivated undergraduate students in classroom settings. A pre-post quasi-experimental design was employed, with data collected through an online questionnaire. 150 female EFL students participated. The results revealed statistically significant differences at the 0.05 significance level in the average comments about Gemini's effectiveness as an AI tool for motivating undergraduate students to learn EFL. The observed variations significantly supported the post-application phase. However, several challenges were identified in using Gemini for EFL, including repetitive words, limited vocabulary (62%), lengthy and non-concise answers (57.3%), uncertainty about information accuracy (49.3%), unclear question format comprehension (42%), and an abundance of similar information sources (39.3%). These findings emphasized the need for further investigation to maximize Gemini's potential and address existing challenges, thereby enhancing the EFL learning experience for all students.

Another study by Ananda & Salmiah (2024) also explored Gemini. The objective of this study was to understand students' perceptions of using Gemini as a tool in the English writing process. This qualitative research used semi-structured interviews to collect data, with interviews consisting of main questions and follow-up questions based on initial responses. The study involved 9 selected EFL students

out of 30. Most students already had their own AI technology applications, making them reluctant to adapt to AI technology applications like Gemini. However, students recognized that Gemini had many features that were highly beneficial in the writing process. While students preferred AI technology applications they had used before over Gemini, based on students' perceptions, researchers believed Gemini would be used as a writing tool in the future.

Imran & Almusharraf (2024) also conducted research on Gemini and its features, including its ability to process data from text, images, audio, and video, and generate various types of content. This study reviewed recent empirical research, technology in practice, and the relationship between Gemini technology and the educational landscape. The report further explored Gemini's relevance for future educational endeavors and practical applications in emerging technologies. Additionally, it addressed significant challenges and ethical considerations that needed to be tackled to ensure responsible and effective integration of Gemini into the educational landscape.

A further study examined Gemini's potential, focusing on its core functionalities such as multimodal capabilities and the Mixture of Experts (MoE) architecture. By reviewing existing research, the study analyzed Gemini's strengths compared to previous models in areas such as natural language processing, mathematical reasoning, and code generation. It also discussed Gemini's potential applications across various fields, highlighting its capability to revolutionize research, education, and creative endeavors. The study acknowledged the ongoing development of Gemini and suggested areas for further exploration, contributing to the growing understanding of Gemini's potential impact on the future of artificial intelligence (Suthar & Digaswala, 2024).

From these five studies, there was a noticeable gap. While the studies had explored various aspects and potentials of Google Gemini in the context of education and English language learning, none had thoroughly investigated the direct experiences of higher education students using the Gemini chatbot in English language learning. The study titled "Exploring Higher Education Learners'

Experience of Utilizing Gemini Chatbot in English Language Learning" aimed to address this gap by using a case study methodology and involving English education students as participants. This research examined how students perceived the use of the Gemini chatbot in their learning process, identified the benefits and challenges they faced, and evaluated Gemini's effectiveness in enhancing their English language skills. By focusing on user experience and the higher education context, this study had the potential to provide new, relevant insights into the application of Gemini in English language learning.

1.3 Research Questions

1. How do higher education learners experience using the Gemini chatbot for English language learning?
2. What difficulties do students encounter while using the Gemini chatbot for English language learning?

1.4 Research Objectives

1. To explore the experiences of higher education students in using the Gemini chatbot to learn English.
2. To identify the difficulties faced by students when using the Gemini chatbot for English language learning.

1.5 Significances of Study

1. For Students
   This research was expected to provide insights into how the Gemini chatbot could be effectively utilized in English language learning, enabling students to maximize the use of this technology to enhance their language skills. By identifying the difficulties and challenges faced, students were anticipated to find solutions to overcome these obstacles in using the chatbot, thereby making the learning process smoother and more effective.
2. For Lecturers
   This research was expected to provide valuable insights for lecturers on how students interacted with the Gemini chatbot, enabling them to integrate this

technology more effectively into their teaching methods. By understanding the challenges faced by students, lecturers were anticipated to design better teaching strategies and provide appropriate support to overcome these difficulties.

3. For Researcher

This research provided data and initial findings that could serve as a foundation for further studies on the use of chatbot technology in English language learning and other educational fields.

4. For Other Researchers

The research findings could encourage further innovation in the development of educational technology, focusing on enhancing user experience and learning effectiveness.